REMARKS

Claims 1-11 and 33-38 are pending.

Claims 1-4 stand rejected under 35 USC §103(a) as being allegedly unpatentable over Furuya et al (US 6,084,215) in view of Kholodenko et al (US 6,310,755).

Claims 5-9 and 33-38 stand rejected under 35 USC §103(a) as being allegedly unpatentable over Furuya et al (US 6,084,215) in view of Kholodenko et al (US 6,310,755) and further in view of Mahawili (US 5,059,770) or Carman et al (US 5,294,778).

Claim 10 stands rejected under 35 USC §103(a) as being allegedly unpatentable over Furuya et al (US 6,084,215) in view of Kholodenko et al (US 6,310,755) and further in view of Weber (US 4,518,848).

Claim 11 stands rejected under 35 USC §103(a) as being allegedly unpatentable over Furuya et al (US 6,084,215) in view of Kholodenko et al (US 6,310,755) and further in view of Yoshida (US 6,080,970).

Rejection under 35 USC §103(a) – claims 1-4

Claims 1-4 stand rejected under 35 USC §103(a) as being allegedly unpatentable over Furuya et al (US 6,084,215) in view of Kholodenko et al (US 6,310,755). This rejection is respectfully traversed.

Under MPEP §706.02(j), in order to establish a prima facie case of obviousness required for a §103 rejection, three basic criteria must be met: (1) there must be some suggestion or motivation either in the references or knowledge generally available to modify the reference or combine reference teachings (MPEP §2143.01), (2) a reasonable

expectation of success (MPEP §2143.02), and (3) the prior art must teach or suggest all the claim limitations (MPEP §2143.03). See In re Royka, 490 F. 2d 981, 180 USPQ 580 (CCPA 1974).

Furuya describes a spring-mounted temperature measurement apparatus disposed within a wafer holder. Further, Furuya describes measuring the temperature of a wafer in **absence of a plasma process** in a wafer storage chamber (FIG. 1).

Kholodenko describes a heater 235 embedded in the base 175 rather than in the dielectric 115 of the electrostatic member 100. See col. 10, lines 22-24.

1. There is no motivation in Furuya or in Kholodenko, which suggests that both references be combined in the manner proposed.

Applicants respectfully assert that there is no impetus to combine Furuya with Kholodenko in the manner proposed. First, with regard to the modification of Furuya and Kholodenka, it is well known that in order for any prior-art reference to be validly modified for use in a prior-art §103 rejection, the reference itself must suggest the desire for modification. E.g., as was stated in In re Fritch, 972 F.2d 1260, 1266, 23 USPQ 2d 1780, 1783-84 (Fed. Cir. 1992):

> The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification.

Turning now to the cited art, Furuya describes an apparatus for measuring the temperature of a wafer "in an electrical characteristic test and reliability test for chips." Col. 2, lines 44-45.

It should be clear that the addition of plasma to anything in Furuya will alter if not destroy a wafer. Thus, plasma cannot be introduced in Furuya without obliterating its intended purpose. As held in *In re Gordon*, if the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

Further, Furuya states that "in carrying a reliability test for a wafer, a wafer W is integrated with a contactor 3 into a single entity on a wafer holding table. In this state, each wafer is put into each wafer **storage chamber** 1." Col. 7, lines 6-10. "In the temperature control compartment 1A, a base 5 is provided." Col. 7, line 30. "Between the base 5 and pressure plate 7, a support plate 8 is provided in parallel with the base 5". Col. 7, lines 40-41. The **storage chamber** described in Furuya does **not** include any additional heating flux from a plasma process. In particular, Furuya describes a support plate 8 that includes a bottom jacket 9 in a temperature control compartment 1A of a **wafer storage chamber** 1 in the **absence of a plasma process**. As pointed in the Final Office Action at page 2, Furuya does not teach or suggest a flat support **receiving an incoming flux from a plasma during a process and the flat support bonded to the base by the layer of thermal insulation material**.

Furthermore, Applicants believe that in fact Furuya teaches away from "receiving an incoming flux from a plasma during a process" because the apparatus disclosed in Furuya is for measuring the temperature of a wafer **outside a plasma process**.

> As shown in FIG. 1, the wafer storage chamber 1 is composed of a temperature control compartment 1A and a connector compartment 1B adjacent to the temperature control compartment 1A. Between the compartments 1A and 1B, a

> heat insulation wall (not shown) is provided. The heat insulation wall prevents the rise of the temperature in the connector compartment 1B as much as possible. In the temperature control compartment 1A, **the temperature of the wafer W is kept at a test temperature and the temperate around the wafer W is forced to rise as little as possible.**
>
> Furuya, Col. 7, lines 19-29. (emphasis added).
>
> Moreover, the wafer W in Furuya is kept at a specific test temperature.
>
> In this state, the bottom jacket 9 controls the temperature of the wafer chuck 2 to keep the temperature of the wafer W at a specific test temperature (e.g., **110°C**).
>
> Furuya, Col. 7, lines 64-67. (emphasis added).

The vacuum chucking as described in Furuya would be unsustainable when receiving an incoming heat flux from a plasma. The vacuum chuck in Furuya does not take into account the substantial heat flux contribution to the wafer direction from the plasma process consisting of deposited heat from the plasma and neutral gas plus possible exotheremic chemical reactions on the wafer surface. In contrast to the presently claimed invention, the application taught by Furuya is a **passive** test mode that does not have to contend with thermal input from a plasma apparatus but with stagnant temperature from a heater. Thus, Furuya does not teach receiving an incoming heat flux at the wafer but a stagnation temperature from a heater.

Thus, direct and accurate sensor measurement of the wafer temperature in such processing systems as described by Furuya is very difficult. The direct feedback control scheme for wafer temperature as described in Furuya is not practicable. For the above reasons, the apparatus of Furuya is not designed for use **during a process in a plasma**

chamber. Therefore, one of ordinary skill in the art would not have combined the teachings of Furuya and Kholodenka.

Thus, Applicant submits that the proposed modification of Furuya would render Furuya unsatisfactory for its intended purpose. Pursuant to the ruling of *In re Gordon*, there is no suggestion or motivation to make the proposed modification. Applicant respectfully requests the rejection be withdrawn.

2. Even if Furuya and Kholodenko were to be combined in the manner proposed, there is no reasonable expectation of success for the suggested combination.

Even if the teachings of Furuya and Kholodenko were combined in the manner proposed, the suggested combination would be inoperable. As explained above, the apparatus taught in Furuya operates at a test temperature in the range of 110°C. In contrast, Kholodenko teaches that the "electrostatic member 100 and base 175 are heated to a temperature of up to 600°C." The "electrostatic chuck 55 and the plug 345 are maintained at a temperature of about 600°C." See Kholodenko, Col. 9, lines 50-51; Col. 14, lines 46-47. The final office action contends that "it would have been obvious to one of ordinary skill in the art of Furuya with the plasma heating flux as an additional heating means to further provide the uniform heat across the chuck." Page 2 of the Final Office Action.

Contrary to the above assertions of the Final Office Action, the introduction of plasma heating flux to the apparatus of Furuya would render the apparatus inoperable. Several components (such as the seal ring 24 made of silicone rubber, the silicone rubber film 25, the O ring 27, etc...) in Furuya would completely melt under the extremely high

temperature (600°C as taught by Kholodenko) created by the plasma heating flux. Thus, the apparatus of Furuya when combined with the teachings of Kholodenko would be inoperable.

The proposed combination changes the principle of operation of Furuya: Furuya is a passive testing device that does not receive any incoming heat flux from a plasma. Further, Furuya does not take into account the chemical reactions on the wafer surface resulting from deposited heat from a plasma and neutral gas. Also, the vacuum chucking of Furuya is unsuitable for use in a plasma process. Finally, direct and accurate sensor measurement of the wafer in the system described by Furuya would be extremely difficult and not practicable. As held in *In re Ratti*, if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).

Thus, Applicant submits that there is no reasonable expectation for success for the suggested combination of Furuya and Kholodenko and respectfully requests the rejection be withdrawn.

Rejection under 35 USC §103(a) – claims 5-9 and 33-38

Claims 5-9 and 33-38 stand rejected under 35 USC §103(a) as being allegedly unpatentable over Furuya et al (US 6,084,215) in view of Kholodenko et al (US 6,310,755) and further in view of Mahawili (US 5,059,770) or Carman et al (US 5,294,778). This rejection is respectfully traversed.

These rejections are respectfully traversed for at least the reason that each of the rejected claims ultimately depend on an above-discussed allowable base claim. The arguments set forth above regarding the base claims are equally applicable here. The base claims being allowable, the dependent claims must also be allowable. Therefore, applicant respectfully requests the rejection be withdrawn.

Rejection under 35 USC §103(a) – claim 10

Claim 10 stands rejected under 35 USC §103(a) as being allegedly unpatentable over Furuya et al (US 6,084,215) in view of Kholodenko et al (US 6,310,755) and further in view of Weber (US 4,518,848). This rejection is respectfully traversed.

These rejections are respectfully traversed for at least the reason that each of the rejected claims ultimately depend on an above-discussed allowable base claim. The arguments set forth above regarding the base claims are equally applicable here. The base claims being allowable, the dependent claims must also be allowable. Therefore, applicant respectfully requests the rejection be withdrawn.

Rejection under 35 USC §103(a) – claim 11

Claim 11 stands rejected under 35 USC §103(a) as being allegedly unpatentable over Furuya et al (US 6,084,215) in view of Kholodenko et al (US 6,310,755) and further in view of Yoshida (US 6,080,970). This rejection is respectfully traversed.

These rejections are respectfully traversed for at least the reason that each of the rejected claims ultimately depend on an above-discussed allowable base claim. The arguments set forth above regarding the base claims are equally applicable here. The

base claims being allowable, the dependent claims must also be allowable. Therefore, applicant respectfully requests the rejection be withdrawn.

Conclusion

For all of the above reasons, applicants submit that the amended claims are now in proper form, and that the amended claims all define patentable subject matter over the prior art. Therefore, Applicants submit that this application is now in condition for allowance.

Request for allowance

It is believed that this Amendment places the above-identified patent application into condition for allowance. Early favorable consideration of this Amendment is earnestly solicited. If, in the opinion of the Examiner, an interview would expedite the prosecution of this application, the Examiner is invited to call the undersigned attorney at the number indicated below.

Respectfully submitted,
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